ture and orographic features of the regions traversed accompanied Dr. Bell's paper.

The 'Report of the Geological Section, for 1900–1901,' was then presented by Mr. H. M. Ami, in which were pointed out the nine important discoveries in the Chazy, Trenton, Utica and Lorraine formations in the Paleozoic about Ottawa as well as those in the Pleistocene and marine clays, sands and gravels, etc., of the same district.

H. M. Ami.

SHORTER ARTICLES.

ARSENIC TESTS.

The note concerning arsenic tests on page 313 of the current volume of Science brings to my mind some experiments made while testing for arsenic in glycerol, an account of which is found in the *Journal American Chemical Society* for Nov., 1895. I found the destruction of the organic matter (before applying the Marsh test) by a mixture of sulphuric acid and nitric acid (30 to 1) caused a loss of arsenic in some samples but not in others. In one sample treated with this mixture it was found impossible to detect even added arsenic. My conclusion at the time was "that some at least of the samples contain, or are decomposed into, something capable of holding back arsenic. This leads to the query: What is the effect of the combined glycerol present in the toxicological examination for arsenic? May not the trouble with the glycerol be due to a decomposition product which could also be formed in the supposed case?" I have never had time to investigate this point myself, and as far as I know it has never been discussed in print. May not the trouble with the Marsh test as applied to beer be due to the same cause? I was able to detect arsenic in the above-mentioned case by adding the sample diluted with water directly to the reduction flask.

A very simple, convenient and delicate method for detecting arsenic in glycerol is mentioned by several writers. I am not certain who first applied it, but think it was Ritsert. The glycerol is diluted with an equal volume of water, HCl and zinc added, and a yellow coloration obtained, if arsenic is present by exposing filter paper, moistened with either silver nitrate solution (1 to 1) or saturated mercuric chloride solution to the evolved gas. A twenty-five cc. measuring glass is convenient for carrying out the test, the filter paper moistened with the solution being placed over the mouth. This test carried out with mercuric chloride is not as delicate as the Marsh test, but when silver nitrate is employed it is about five times as delicate. E. Ritsert (*Pharm. Ztg.*, 1888, 715 and 1889, 104, 360 and 625) finds this test to show 0.001 mg. of arsenic in 1 cc. of solution where the Marsh test only shows 0.01 mg. in 1 cc.

G. E. Barton.

Millville, New Jersey,
Feb. 25, 1901.

PRELIMINARY NOTE ON THE EMBRYOGENY OF NELUMBO.

For two years the writer has had *Nelumbo lutea* under observation and has demonstrated among other points those enumerated below. The discoveries, and the conclusions arising from them, are of such importance that publication in advance of the complete memoir seems advisable. They are as follows:

1. The membrane surrounding the plumule has been shown to be, as conjectured by Wigand, a true endosperm arising within the embryo sac.

2. The embryo is genuinely monocotyledonous in development and the conclusions of Mirbel are erroneous. The plumule arises laterally and at first there is but one cotyledon. Later this bifurcates to form the two fleshy bodies which since Mirbel's researches have been generally regarded as separate cotyledons. For the views of Barthélemy, Richard, Clos and others who have altogether denied the cotyledonary nature of the fleshy bodies, there is no foundation in fact.

3. There is no primary root. The first roots are adventitious and spring from the epicotyl.

Nelumbo, both in its anatomy and embryogeny, conforms to the type of the Monocotyledons and, probably with the other Nymphaeaceae, should be classified in the general vicinity of the Alismaceae.

Harold L. Lyon.

The University of Minnesota,
March 14, 1901.